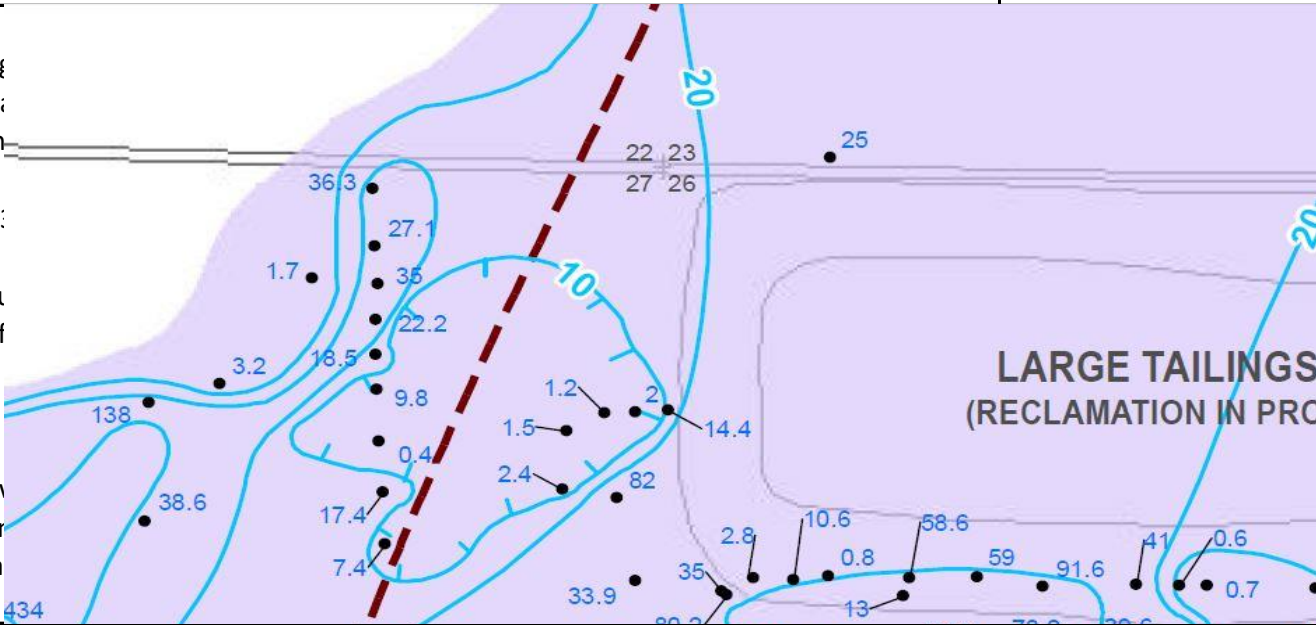

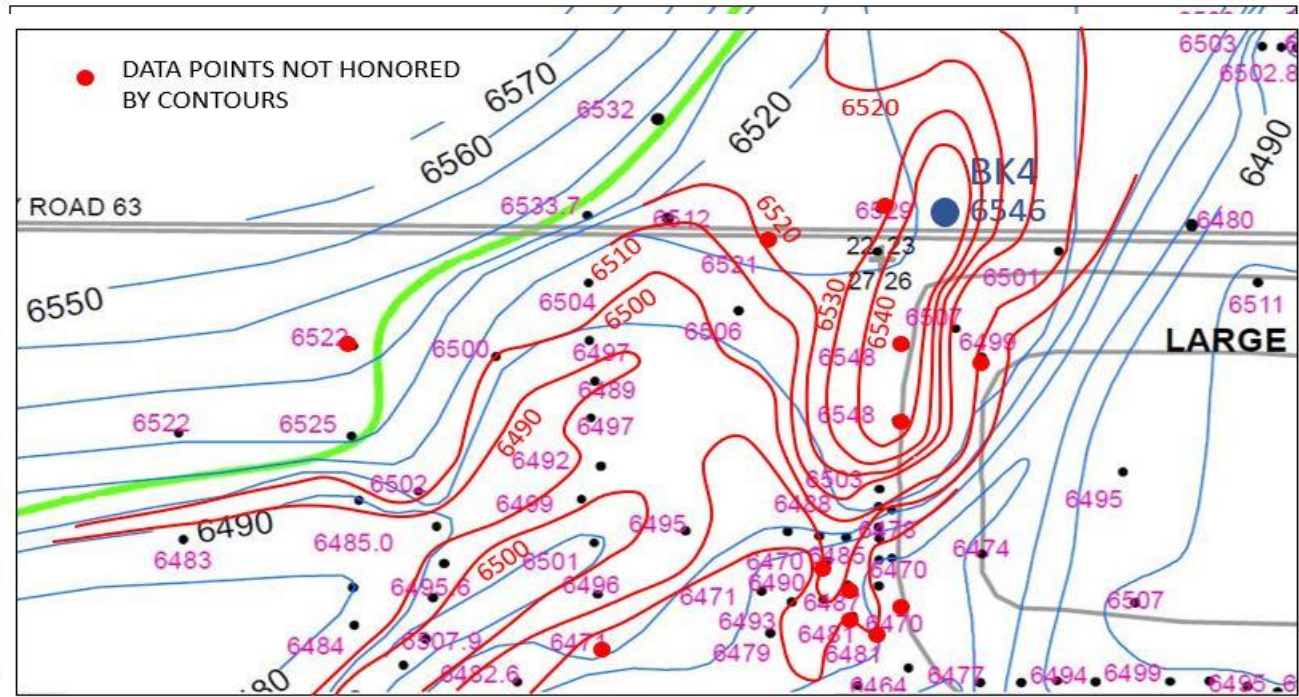


#	Section/Page	Comment	Response
GENERAL COMMENTS			
1	General	Overall, there has been improvement in the quality of the maps and figures provided in the Draft Final Remedial Investigation Report (RI Report). The well identification numbers and values on the maps are legible, especially when enlarged.	Thank you
2	General	Overall, the incorporation of sections for the EPA Phase 2 groundwater investigation report for the San Mateo Creek Basin Legacy Uranium Mines Site and the Homestake/ARCADIS background and supplemental background studies of 2018 and 2019 were good additions to the RI Report. EPA has only a few required revisions as noted in Specific Comments below.	Thank you
3	General	EPA has issues with the structural geologic interpretations depicted on the two Electrical Resistivity Tomography (ERT) survey lines as EPA believes the usefulness of the lines for delineating the top of bedrock/base of alluvium, top and bottom of Chinle sandstone formations, and faulting is limited. However, EPA will make no further comment on the ERT lines herein.	Noted
4	General	There are no comments on the Baseline Ecological Risk Assessment (BERA). However, EPA's risk assessor is continuing to review the BERA and may have comments at a later time.	Noted
SPECIFIC COMMENTS			
1	Section 1.4.2.2. – Removal of Windblown Contamination Areas	The 5.0 picocuries per gram (pCi/g) and 15 pCi/g above-background soil standards for Radium 226 established in 40 CFR Part 192, Subpart B were used for the excavation of windblown contamination within and outside of the NRC Source Materials License boundary. These are potentially relevant and appropriate requirements for the part of the Homestake facility that will remain under federal control when turned over to the DOE Legacy Management Program. For those areas that are outside of the License boundary, the CERCLA protective cleanup level for Radium-226 is based on risk assessment to achieve the EPA's acceptable carcinogenic risk range of 10-4 to 10-6. Therefore, please include additional documentation and discussion in the appropriate sections of the RI Report on Radium 226 concentrations measured in soil outside of the License boundary for the area of windblown contamination prior to soil reclamation and verification sampling. Additionally, include a summary discussion of the results from Appendix C (Completion Report for Reclamation of Off-Pile Areas at the Homestake Facility) on the residual Radium 226 levels. For example, there were 78 confirmatory soil samples collected that showed a mean concentration of 2.95 pCi/g and a standard deviation of 1.89 pCi/g for Radium 226, with a combined mean + standard deviation at the 95 percent confidence level of 3.5 pCi/g for Radium 226. Also indicate if there were any soil areas beyond the windblown contamination area that would exceed a health-based PRG for Radium 226.	HMC will provide additional summary information on the soil cleanup that was completed, the concentration of Radium 226 in areas outside the license boundary, and estimate the risk range for radium in soil.

2	Section 2.6.1.1 – San Mateo Alluvial Aquifer, page 2-7	<p>a. EPA disagrees with the last sentence in the second paragraph on page 2-7, which states:</p> <p><i>“Because of the permeability of the sandstone, it is not believed that this bedrock ridge significantly interrupts or alters groundwater flow into the Site.”</i></p> <p>First, Homestake has not provided supporting hydrogeological data (hydraulic conductivity, transmissivity, and sandstone permeability) for this statement. Second, Homestake does not know the areal and vertical extent of the bedrock ridge to the north or to the south of geologic boring BK-4. Historical well and geologic borehole data can be used to interpret the base of alluvium structure by mapping south of BK-4 but without conducting additional coring, the extent of the sandstone formation cannot accurately be defined. Until BK-4 was cored, the presence of this sandstone ridge was unknown and Homestake’s conceptual site groundwater and geologic models for this area of the site were flawed. Third, the base of alluvium and top of bedrock contact at BK-4 is likely an erosion surface, with 18 feet of sandstone encountered in BK-4 on top of Chinle Group shale. How the thickness of the sandstone varies over this erosional surface is also not known. Lastly, and more importantly, the prominence (structural position) of the Chinle shale beneath the sandstone along this bedrock ridge and its significance as a barrier to groundwater flow is unknown. Today’s water levels in the alluvial aquifer are artificially elevated, in part from Homestake’s groundwater corrective action and likely in part from historical mine water discharges north of the Site that infiltrated and recharged the alluvium and flowed as groundwater downgradient into the alluvial of the lower San Mateo Creek basin floodplain area (see EPA’s Phase 2 Groundwater Report for the San Mateo Creek Basin Legacy Uranium Mines Site, 2018). Homestake discusses the increased alluvial saturation from these two sources in the fourth paragraph on page 2-7. Historical water levels reported by Chavez (1961) for the alluvial aquifer are approximately 20 feet lower in the area of BK-4 than they are today. Considering the 1960 water levels as approximately pre-milling, natural historical water levels for the alluvial aquifer, the bedrock ridge at BK-4 (i.e., the structural top of the Chinle shale within the ridge) likely becomes a more prominent physical barrier to alluvial groundwater flow and potentially causes a</p>	<p>Additional text will be added to discuss the historical saturation and the sentence regarding the flow will be deleted or modified.</p>
		<p>b. EPA does not understand the reference to Figure 1-4 in the forth paragraph on page 2-7. Please verify it is the appropriate referenced figure and revise if it is not.</p>	
		<p>c. Please revise the fifth full paragraph on page 2-7 to discuss the relatively low hydraulic conductivities in the area south of the bedrock ridge at BK4. Hydraulic conductivity values range from 0.4 feet/day to 14.4 feet/day. These low values appear to be in the area of the bedrock ridge based on mapping of the base of alluvium structure. See Figure 1, below.</p>	
			<p>The reference was corrected to Figure 1-3, which is the Grants Mineral Belt Overview Map.</p>
3	3. Section 2.6.1.2 – Lobo Alluvium	<p>In the first paragraph supplemental bi such assessment alluvial channel report, Section :</p> <p>“The soluble su recharge/runoff</p> <p>In Section 3.2.4</p> <p>“Samples from v and P3, indicating water in the ma</p>	 <p>led to discuss the possibility that Lobo Creek alluvial groundwater may f San Mateo Creek alluvial channel in the area north of the LTP.</p>

4	4. Section 2.6.2 – Upper Chinle Aquifer, page 2-8:	 <p>a. Please expand on the discussion of the sandstone encountered at the base of the alluvium at BRT to be part of the Upper Chinle Aquifer or another Chinle sandstone aquifer. To support such discussions, please construct an east-west structural cross section using geologic borehole information from wells CW1, CW2-1, CW3, Chavez well no. 5, and boring BK4 as well as any other wells deemed appropriate to delineate the base of alluvium contact along the transect. It may also be appropriate to use the Electrical Resistivity Tomography (ERT) line to assist in cross-section construction. Plot water levels on the cross section, including the historic water level for the alluvial aquifer from 1960 (Chavez, 1961)</p>	HMC will add the requested cross-section to the RI and include text which discusses the sandstone discovered at boring BK-4 and historic versus recent alluvial saturation.
		b. Please include maps of the transmissivity and hydraulic conductivity for the Upper Chinle Aquifer in the RI Report to support the discussion of the last paragraph on page 2-8 and reference the appropriate figures.	An additional figure showing the Upper Chinle Aquifer hydraulic conductivities will be added to the RI.
5	Section 2.6.3 – Middle Chinle Aquifer	a. Please include hydraulic conductivity and transmissivity maps for the Middle Chinle Aquifer and expand on Section 2.6.3 to discuss such properties in more detail (like those discussions for the Upper Chinle Aquifer).	An additional figure showing the Middle Chinle Aquifer hydraulic conductivities will be added to the RI.
		b. In the fourth full paragraph on page 2-10, it is unclear why there is a mixing zone for the Middle Chinle aquifer west of the west fault if the Middle Chinle groundwater upwells into the alluvial aquifer. Would not the mixing of Alluvial and Middle Chinle groundwater occurring in the alluvial aquifer downgradient of the subcrop area? It is stated in the paragraph that “This prevents the alluvial aquifer from affecting the water quality of the Middle Chinle aquifer on the west side of the west fault.” Please provide further clarification of the significance of the hydraulic connection and groundwater flow direction on water quality for these two aquifers west of the west fault.	HMC will provide additional text and rational which supports the Middle Chinle conceptual model.
6	Section 2.6.4 – Lower Chinle Aquifer	Please include maps for hydraulic conductivity and transmissivity in the RI Report for the Lower Chinle Aquifer	An additional figure showing the Lower Chinle Aquifer hydraulic conductivities will be added to the RI.
7	Section 2.7.1 – Phase 2 Ground-Water Investigation Report for the San Mateo Creek Basin	<p>Revise the last sentence of the second bullet beginning on page 2-13, and continuing onto page 2-13, to read as follows:</p> <p>“It is also important to note that pre-mining background water quality for uranium and selenium are not available, which makes it difficult to establish that the plumes are the result of a release without using other lines of evidence.”</p>	Text to be revised as requested.
8	Section 2.7.3 – Supplemental Background Soil and Groundwater Investigation Report, page 2-14:	<p>a. Revise the second sentence of the last bullet to read as follows:</p> <p>“There is evidence that the sandstone is permeable.”</p>	Text to be revised as requested.
9	Section 3.1.2 – Homestake Facility Secondary Sources, page 3-1:	The bullet statement at the end of the page appears to be incomplete. Please revise.	Text to be revised to indicate wind can transport radon and dust.
10	Section 3.2.1.1 – Chemicals and Radionuclides of Potential Concern and Cleanup Levels Developed for NRC License, page 3-8:	a. See Specific Comment No. 5.b, above, regarding Mixing Zone as it pertains to the discussion in the fourth paragraph. Modify the fourth paragraph if appropriate to clarify the issue raised in 5.b.	HMC will provide additional text and rational which supports the Middle Chinle conceptual model.
		<p>b. Revise the sentence at the top of page 3-10 as follows:</p> <p>“For the purposes of this RI, the NRC Site Cleanup Levels will be considered preliminary remediation goals (PRGs) for groundwater unless directed otherwise by EPA. EPA is currently reassessing the appropriateness of the NRC Site cleanup levels for groundwater and may decide to modify some cleanup levels for some aquifers.”</p>	HMC will revise the text; however, EPA's evaluation will need to be concluded prior to finalizing the RI.
11	Section 5.2.1.1 – Current and Future Land Use	In the last paragraph of this section, Homestake discusses a draft deed restriction that prohibits residential and agricultural use of the LTAs. EPA has received the draft deed restriction, which is entitled “Declaration of Institutional Controls”, for review.	Noted

12	Section 5.2.1.4 – Potential Routes of Migration, page 5-5:	Please revise key sentences in this section to indicated that the deed notice, if selected as part of a remedial alternative by EPA, would prohibit residential and agricultural land uses and ground water use. As written now, it states that such land uses “are” restricted.	Text to be revised as requested.
13	Figure 2-21 – Base of Alluvial Contour Map	The base of alluvium structure contour map still does not honor the data points at many locations. See Figure 2, below, which shows the well data points not honored by the contour lines in the area of BK4. As an example of a mapping effort that honors the data points, EPA has recontoured the area near BK4 (see Figure 3 below). EPA has previously requested that this area of the Site be recontoured using the Supplemental Background Study data, as well as any additional geologic boring data that may have been collected, and at a larger scale to show better detail of the base of alluvium structure. Such mapping should help delineate the bedrock ridge encountered at BK4.	HMC will revise the base of alluvium map.
14	Table 5-1 – Data Sets Evaluated, page 5-2	HMC-16 EPA at NRC a for the	he risk assessment use HMC-16 as the sole location of radon background. te data to HMC-10FF will be limited to the uncertainty section.
15	Section 5.2.1.1 – Current and Future Land Use, page 5-4, first paragraph:	It was EPA is	
16	Table 5-3 – Conceptual Site Model for Human Receptors for Land Treatment Areas, page 5-9:	Please contai ground	line from "pumped groundwater" to "Surface Soil" and "Subsurface Soil"
17	Section 5.2.2.2.4 – Air, page 5-14:	It was EPA is	ita that is specific to the LTAs. The sentence was deleted because it is not :reening.
18	Table 5-7 – Composite Worker RadPRGs for Ambient Air, page 5-15:	It was	will be added to this table.
19	Section 5.2.2.4 – Screening Results, Soil, page 5-15:	It was reported that background raw data were used to estimate background threshold values (BTVs) with ProUCL. It was not clear what value is selected as BTV (i.e. geometric mean, UCL 95%, median etc...). Background data are usually homogenous and arithmetic mean is enough to measure central tendency of the data. If the data is not homogenous, then the same statistics used for the site should be used for the background value (i.e. UCL95% for site should be compared with UCL95% background). When comparing to background data, EPA guidance also recommends comparing the two data sets using hypothesis testing to detect significant differences between background and onsite contaminant concentrations.	Hypothesis testing will be used as the basis of identifying whether an analyte exceeds background. No BTVs will be provided.
20	Footnote to Table 5-11, page 5-29:	Correct the foot note on CS to refer to Table 5-12.	This typo will be corrected.
21	Section 5.2.1.5.4 – Comparison to Background, page 5-52:	Soil: Need to explain background threshold value (BTV). How it was determined. What type of statistics was run through the data? Why it was considered adequate to compare to site data? Air: A new term was used “upper simultaneous limit (USL)” defined as representative value for a maximum background concentration and used as a BTV for air concentration. It is unacceptable to use the maximum background level to compare to 95% UCL value of site data. Need to use the 95%UCL on the arithmetic mean for background data to compare with the 95% UCL on arithmetic mean of background data.	See response to Comment #19.



22	Table 5-19 – Surface Soil Background and Homestake Facility Soil Comparisons, page 53:	<p>The table heading should reflect air and not surface soil.</p> <p>The number representing the maximum air value was used as BTV for air. The 95% UCL on the arithmetic mean using ProUCL for HMC-16 should be used instead for calculating the ratio of site to background level.</p>	<p>The table heading will be corrected.</p> <p>See response to Comment #19.</p>
23	Table 5-20 – Surface Soil Background and Homestake Facility Soil Comparisons, page 54:	a. The statistics used to calculate the BTV for soil was different from the statistics used to calculate the site data. The site and background data should be using the same statistics to properly compare the two data sets. EPA recommends using the 95% UCL on the arithmetic mean using ProUCL model or equivalent model to calculate the one value representing the areas of exposure.	See response to Comment #19.
		b. Under “Retain COPC or ROPC?” column a symbol of HQ was provided without explaining what it stands for in the footnotes. If it is meant for Hazard Quotient, then this cannot be used for ROPC since HQ is used for non-carcinogens and ROPC evaluated based on cancer effects. Please adjust.	We will replace terminology "HQ" with a risk ratio (or "RR") to avoid the carcinogenic/noncarcinogenic imagery use of HQ implies.
		c. In the footnote a “+D” notation was added. Please provide which ROPC screening included their progenies.	The USEPA/ORNL calculator is no longer highlighting this notation. All the ROPCs now have all the daughters evaluated in the calculator. The notation was erroneously retained from the last version and will be removed from the footnotes.
24	Table 5-21 – Surface Soil Background and Land Treatment Areas Soil Comparisons for the RI HHRA, page 5-57:	Same first two comments as comment No. 23 for Table 5-20 above.	Please see response to Comment No. 23 above.
25	Table 5-22 – Radon in Air Background Compared to Site Activity, page 5-60:	<p>HMC-10FF was referred to as background air monitor. EPA and NRC do not recognize HMC-10ff as a background air monitor. Please remove from the table.</p> <p>Remove the USL value for HMC-16 air monitor as a background level and retain the HMC-16 UCL95 value as a background level for the site.</p>	Please see response to Comments No 14. and No. 19 above.
26	Section 5.2.5.2 – Risk Description, page 5-61, second paragraph:	<p>It was reported that “The inherent risks due to background exposure, whether Site concentrations exceed background as indicated by the ratio of the UCL95 to the BTV,...”</p> <p>Similar statistics must be used for comparing site concentrations to background concentrations. Using site representative average value to compare to background representative maximum values is not adequate.</p>	Please see response to Comment No. 19 above.
27	Section 5.2.5.2.1 – Future Composite – Worker Homestake Facility, page 5-61, second paragraph:	<p>It was reported that “Risks due to radon, once background is accounted for, are in the range of no excess risk to 2×10^{-2}, above the risk management range.”</p> <p>Risk was calculated as a risk range due to the use of two separate radon background concentrations. Use only the 95%UCL on the arithmetic mean of 551 pCi/m3 as a background air level and report the risk without using a range.</p> <p>I got a risk of 7.7E-03 or rounding it to 8E-03 rather than the 2E-02. Please check your calculations.</p> <p>This section seems to indicate that outdoor radon was evaluated separately than indoor air for a composite worker. Composite worker scenario assumes exposures to both outdoor air and indoor air. Therefore, EPC of 1074 pCi/m3 which is calculated for both outdoor and indoor radon air concentrations should be used for this exposure scenario.</p>	<p>Please see response to Comment No. 19 above.</p> <p>The calculations will be checked.</p> <p>The Composite Worker was modeled with the EPC of 1074 pCi/m3, as indicated in Table 5-23. The text will be revised to clarify.</p>

28	Section 5.2.5.2.1 – Future Composite Worker – Homestake Facility, page 5-61, third paragraph:	<p>It is reported that “Consultation with EPA indicated that risk cannot exceed 1, and the RadPRG calculator defaults to a different model above this point. There may be a discrepancy in risk estimates due to use of different models simply because background risks for radon, even after daughter progeny below Po-214 are removed, are so high. The EPCs for background and the outdoor air at the Site are similar, and risk estimates are also expected to be similar.”</p> <p>The RadPRG calculation defaults to a different model above an excess high cancer risk of 1E-02 and not 1. A one-hit equation model is usually used instead.</p> <p>EPA disagrees that the EPCs for background and the outdoor air at the Site are similar. The UCL95% on the arithmetic mean for the site over a period of at least 4 years was estimated at 949 pCi/m3 whereas the UCL95% on the arithmetic mean for the background area was estimated at 551 pCi/m3. This increase in outdoor radon concentration is expected to have an additional excess cancer risk of 8E-03 over background levels.</p>	<p>The text will be revised to indicate that the RadPRG calculation defaults to a different model above an excess cancer risk of 1E-02 .</p> <p>Please see response to Comment No. 19 above. A BTV will not be computed for background and text will be revised accordingly.</p>
29	Section 5.2.5.2.1 – Future Composite Worker – Homestake Facility, page 5-62, first paragraph:	<p>Please remove the whole paragraph. It is not relevant to the baseline risk assessment.</p> <p>The baseline risk assessment is an analysis of the potential adverse health effects (current or future) caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these releases (i.e., under an assumption of no action).</p>	HMC agrees to delete the paragraph.
30	Section 5.2.5.2.2 – Future Construction Worker – Homestake Facility, page 5-62, fourth paragraph:	<p>It is reported that “...and outdoor air based on all data combined from 2014 through 2018 from the HF and LTAs. The indoor air was used to represent potential trench air radon levels. The total cumulative cancer risk for air is 2 x 10-1, which is above the upper bound of the risk management range.</p> <p>To my knowledge there was no outdoor air data from LTA. Please explain.</p> <p>The total cumulative cancer risk from air was reported at 2E-01. Table 5-25 shows a risk of 8E-04. Please adjust.</p> <p>It is reported that “When inherent background is subtracted out of the total risk, the cancer risk attributable to the Site ranges between no excess risk to 4x10-4, which is acceptable to above the risk management range.”</p> <p>It was not clear where the excess cancer risk of 4E-04 was estimated. Table 5-25 provide a different excess cancer risk. Please remove a range of excess cancer risk from no risk to 4E-04. Use only one value for the background which is the 95%UCL value. Take out the statement “which is acceptable to above the risk management range”. Excess cancer risk of 4E-04 is not an acceptable level. This is left later for risk management decision.</p>	<p>The words "and LTAs" will be deleted, and add the phrase "which was used to represent the HF and the LTAs" .</p> <p>Values will be checked between the tables and the text.</p> <p>Please see response to Comment No. 19 above. A BTV will not be computed for background and text will be revised accordingly.</p>
31	Section 5.2.5.2.2 – Future Construction Worker – Homestake Facility, page 5-62, last paragraph:	<p>It is reported that “A significant part of the cancer risk is related to Site background radon levels (refer to Table 5-25). Radon activity in outdoor air (949 pCi/m3) at the Homestake Facility is slightly higher than outdoor background concentrations of 551 pCi/m3 based on a UCL95, and similar to the BTV of 996 pCi/m3 based on the data from HMC-16. Assuming trench air radon activities are as high as Site indoor air which is 1.837 pCi/m3, estimated trench air concentrations are less than the predicted Cibola County average indoor air value from EPA (2019d) of 2000 - 4000 pCi/m3.”</p> <p>The excess cancer risk from outdoor background concentration of 551 pCi/m3 was not reflected in Table 5-25. Please provide the risk associated with this level of radon exposure. Remove the BTV value of 996 pCi/m3 since it was based on unsupported Value (representative of maximum value) by EPA guidance when comparing to background data.</p>	Please see response to Comment No. 19 above. A BTV will not be computed for background and text will be revised accordingly.

32	Section 5.2.5.2.4 – Future Composite Worker – Land Treatment Areas, page 5-63:	Please refer to comments provided above (comment No. 27) on Future Composite Worker Homestake Facility.	Please see response to Comment No. 27 above.
33	Section 5.2.5.2.4 – Future Composite Worker – Land Treatment Areas, page 5-64, second paragraph:	It is reported that “There is also a UCL95 radon concentration of 3,410 pCi/m3 from Valle Verde from EPA (EPA 2014a), but the HMC data are more recent.” Please remove this statement from the report. Since indoor radon in the offsite residential area was not attributed to site related sources. But it was more attributed to type of house structure as to the potential source of indoor air radon gas levels.	HMC agrees to delete the sentence.
34	Section 5.2.5.2.4 – Future Composite Worker – Land Treatment Areas, page 5-64, third paragraph:	It is reported that “Radon concentrations in air are high enough that risk estimates may exceed 1, and when this occurs the EPA ORNL RadPRG calculator defaults to using a different model to predict risk. Therefore, differences in risk estimates between HMC16, Site outdoor air, and combined Site indoor/outdoor air may be indistinguishable. Note that radon in outdoor air (949 pCi/m3) is, however, slightly lower or similar to the BTV at HMC-16 (996 pCi/m3) (Table 5-22) and slightly higher than a UCL95 of 551 pCi/m3 for HMC-16. Excess risk attributable to the Site ranges from no excess risk to 1x10-2.” Please see comment No. 28 above.	Please see response to Comment No. 28 above.
35	Section 5.2.5.2.4 – Future Composite Worker – Land Treatment Areas, page 5-64, last paragraph:	It is reported that “There is limited excess risk attributable to the Site once ambient conditions are accounted for given that subtracting inherent background risk from the Site risk produces a negative number. The LTAs therefore do not appear to have an unacceptable cancer risk for this receptor” Two paragraphs above it was reported that “Excess risk attributable to the Site ranges from no excess risk to 1x10-2. Please remove the last sentence “The LTAs therefore do not appear to have an unacceptable cancer risk for this receptor”	In order to clarify this statement, we will insert the term “site-related” before the word “unacceptable”. See response to Comment No. 31. Subjective terms like unacceptable will be removed.
36	Section 5.2.5.2.5 – Future Construction Worker – Land Treatment Areas, page 5-64:	It is reported that “The total cumulative cancer risk is 4x10-5. This is estimated as the sum of the surface soil pathways at exposure times of 8 hours per day and soil ingestion rates of 330 mg/d plus the sum of the fugitive dust air pathways. External exposure is the only exposure pathway with elevated risks for the soil contact pathways for this receptor.” Table 5-34 had a different cumulative cancer risk, from exposure to soil, than the 4E-05. Please adjust. It is reported that “The major risk driver is radon for risks estimated for the inhalation pathway from measured air concentrations; all other estimated cancer risks fall below the upper bound of the risk management range. Rn-222 risks are elevated for exposure to the Site-wide outdoor and indoor air concentration of 1,074 pCi/m3. This concentration was used to represent exposure to outdoor and trench air concentration. Once background is subtracted from the Site risk, there is little to no excess risk attributable to the Site, since risks for the Site and BTV are both 8 x 10-4. Excess risk (Table 5-34) attributable to the LTAs is zero to 4x10-4.” The BTV value for radon background should not be used to compare with site radon data. The BTV is a representative value for the maximum value. Please use the 95%UCL on arithmetic mean value of 551 pCi/m3 to compare with the 95%UCL on arithmetic mean for site data. Please remove the risk range attributable to the LTAs and provide only one value. The 4E-04 excess cancer value was not reported in Table 5-34. Please report the risks in the table associated with the site data and the inherent background data and the difference attributable to the site. It was reported that “The excess cancer risk attributable to the Site surface soils and air exposure pathways is similar to or less than that due to background. Any cancer risks are largely due to radon in air.”	Text values will be checked to tables for consistency. Please see response to Comments No. 14 and No. 19.

37	Section 5.2.5.2.7 – Potential Risk Estimates for Post-Remedy Groundwater, page 5-81:	Evaluation of residual risk from exposure to chemicals of potential concern (COPC) and radionuclides of potential concern (ROPC) in groundwater at their proposed clean-up levels showed that the estimated excess cancer risk and non-cancer risk is much higher than the EPA’s generally accepted risk levels. Therefore, some means, to prevent groundwater use in the future, need to be put in place post groundwater remedy.	Noted.
38	Added comment from Ghassan	Was the particulate data used in the risk assessment calculations? Need to compare to fugitive dust and use the most conservative.	HMC will review the data and risk for fugitive dust versus the particulate data.
39	Added comment from Phil Turner	BERA - Measurement endpoints - protection and maintenance - need to be definable.	Will review/revise BERA to use definable measurement endpoints.

#	Section/Page	Comment	Response
GENERAL COMMENTS			
1	General	Overall, the Draft Development and Screening of Remedial Alternatives Technical Memorandum (Technical Memorandum) follows the “EPA Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA” very well.	Thank you
2	General	The Feasibility Study phase of the CERCLA RI/FS equivalency analysis should look at those areas of contamination at the Homestake Mining Company site (Site), both within and outside of the Homestake facility NRC Source Materials License SUA-1471 boundary, to determine if there is a need to develop and screen alternatives for addressing Site risks and achieving a CERCLA level of protectiveness. The Site-related contamination present outside of the NRC Source Materials License SUA-1471 boundary that may present an unacceptable risk and require remediation to achieve a CERCLA level of protectiveness are the Land Treatment Areas (LTAs) and the windblown contamination areas. These areas need to be discussed in the Technical Memorandum with regards to nature and extent and risk assessment to evaluate the need for alternative development.	Soil data for the LTAs, Homestake Facility, and areas where remediation of windblown contaminants occurred are being evaluated based on risk assessment for CERCLA protectiveness.
3	General	The initial comments on the Memorandum that EPA discussed with Homestake and the New Mexico Environment Department at the last RI/FS Equivalency meeting are included with the specific comments provided herein.	Noted
SPECIFIC COMMENTS			
1	Section 1.2.5 – Human Health Risk Assessment	a. Section 1.2.5 lacks a discussion of the human health risks associated with areas outside of the Homestake facility, including the LTAs and the outer zone of the windblown contamination area, which is outside of the NRC License Boundary (see Figure 1, below). Homestake has submitted a draft proprietary control for the LTAs that restrict future residential and groundwater use, but there is no discussion of the reason for needing such an institutional control for the LTAs in any future EPA decision-making. Please discuss whether there is a risk to the future resident at the LTAs. Additionally, for the windblown contamination area, the Radium-226 soil cleanup standards from 40 CFR Part 192, Subpart B used for reclamation of soil outside of the NRC License boundary are not considered protective under CERCLA. Please discuss the residual radionuclide concentrations of the reclaimed windblown contamination area based on confirmation soil sample results (Appendix C of the Draft Final RI Report) and whether the residual levels are below the calculated CERCLA risk-based PRG levels for the appropriate land uses. Additionally, please evaluate whether there are other soil areas with windblown contamination beyond the boundary of the outer zone that were excluded from reclamation because the Radium 226 levels were below the 40 CFR Part 192 cleanup standards for Radium-226 but exceed the CERCLA PRGs. Provide a table of the sample radionuclide concentrations for the outer zone soil as well as a figure (map) showing the contaminant concentration distribution to support these discussions.	See response to General Comment #2. Text will be added regarding the relative risks for residents and other types of workers in the LTA compared to the composite worker. Additional information on the windblown remediation will be provided as requested.
		b. A conclusion should be added to the end of this Section or a new Section 1.2.5.1 on Human Health Risk, similar to the section on the Baseline Ecological Risk Assessment (BERA).	The conclusion will be added as requested.
2	Table 1-5 – Applicable or Relevant and Appropriate Requirements	Please make the following revisions to Table 1-5:	
		a. UMTRCA Regulations at 40 CFR § 192 Subparts A, B, and C are “Applicable” requirements only for Title I sites that are exempt from CERCLA. They are potentially “Relevant and Appropriate” requirements for Title II sites, such as the portion of the Homestake facility that will remain under federal control when turned over to the DOE Legacy Management Program.	Revision has been evaluated and modifications have been made to the proposed ARAR Table
		b. Under the “Requirement” column, UMTRCA Regulations of Subparts A and B are at 40 CFR § 192.0 and § 192.1, respectively, not § 192.2.	Revision has been evaluated and modifications have been made to the proposed ARAR Table
3	Section 1.4 – Remedial Action Objectives, page 1-34:	c. SDWA Regulations at 40 CFR §141 – Maximum Contaminant Levels (MCLs) are potentially “Relevant and Appropriate” requirements where groundwater or surface water is considered a potential or current source of drinking water.	Revision to be evaluated
		a. Contaminant levels and exposure routes should be specified in the Remedial Action Objectives (RAOs).	RAOs will be updated to be contaminant and exposure route specific.
		b. There should be two RAOs for groundwater: one to restore groundwater quality in the aquifer(s), the other to prevent exposure to humans.	Two RAOs will be included as suggested.
		c. Examples of the groundwater RAOs are as follows: “Prevent ingestion of groundwater containing site-related inorganic chemicals of concern and radionuclides of concern in excess of state/federal ARARs or site-specific risk-based cleanup levels and a total excess cancer risk of greater than 10-4 to 10-6.” “Restore groundwater quality to state/federal ARARs or background concentrations, whichever are higher, as appropriate, or site-specific risk-based cleanup levels for site-related inorganic chemicals of concern and radionuclides of concern in those portions of the alluvial, Upper Chinle, Middle Chinle, and Lower Chinle aquifers that have been impacted by tailing seepage from the site.”	HMC will consider the suggested RAOs.
		d. Based on other EPA comments herein, assess if RAOs are needed for soils in the LTAs or windblown contamination area.	Additional area of soil contamination will be evaluated as discussed in the response to comments to General Comment #2 and Specific Comment #1.

4	Section 2 – Areas and Volumes of Contaminated Media, page 2-1:	The areas and volumes of contaminated soils in the LTAs and residual areas and volumes of contaminated soil in the windblown contaminated areas, if any, should be discussed. For the windblown area, an assessment should be made of the residual Radium 226 concentrations below the 10.5 pCi/g Part 192 standard in the upper 15 cm of soil and above the risk-based PRP value for Radium 226 from the risk assessment. If there are no volumes and areas of contaminated media above the risk-based PRG values in these areas, it should be stated so.	Should additional areas indicate human health risk, areas and volumes of soil in these areas will be included in Section 2.
5	Section 4 – General Response Actions, page 4-1:	a. General Response Actions that restore groundwater quality do not include institutional controls (ICs). Institutional controls prevent exposure to contamination for protection of human health, which would be an appropriate RAO for groundwater (see Specific Comment 5.c., above). Please revise accordingly.	The language will be revised to remove indication that ICs are General Response Actions that can restore groundwater quality.
6	Table 5-1 – Initial Screening of Candidate Remedial Technologies and Process Options for Groundwater Restoration, pages 5-3 through 5-5:	a. Change the title of Table 5-1 to include Human Health Protection in addition to groundwater restoration.	Title will be revised as indicated.
		b. Include “State Temporary Well Drilling Prohibition” as a Process Option for Institutional Controls General Response Actions. The New Mexico Office of the State Engineer issued an order for prohibiting well drilling for the remedial action at the former Homestake and Bluewater mill sites in May 2018.	The NMED health advisory and OSE well drilling prohibition will each be included as ICs.
		c. Local Government Zoning Change should also be considered as a Government Control Process Option to prevent residential land use at the LTAs to protect human health from exposure to soil contamination.	Zoning and local ordinances will be considered, but screened out because they can be easily revoked or revised.
		d. Add a row for “Treatment” under General Response Actions, with “Off-Site Treatment” under Remedial Technology, “Well Head” under Process Options, and “Filtration at Well Head” under Description.	Treatment at the well head will be added as a remedial alternative as suggested.
7	Section 5.2 – Detailed Screening of Retained Technologies and Process Options, page 5-10:	It is noted that application and receipt of permits is not required for on-site response actions taken under Fund-financed or enforcement authorities of CERCLA. This does not remove the requirement to meet (or waive) the substantive provisions of permitting regulations that are ARARs.	Since remedial measures will be NRC led and not EPA led, under CERCLA, permits will likely need to be obtained.
8	Table 5-3 – Detailed Screening of Technologies and Process Options for Groundwater, pages 5-11 and 5-12:	a. Include Temporary State Well Drilling Prohibition as a Process Option for Institutional Controls.	The OSE IC will be added as suggested; however, as discussed the measure is not temporary.
		b. Please add the “Temporary State Well Drilling Prohibition” as a Process Option for Institutional Controls to be screened.	The OSE IC will be added as suggested; however, as discussed the measure is not temporary.